بسم الله الرحمن الرحيم

Islamic University of Gaza
Engineering Statistics (ECIV 2305)
First Semester (2005-2006)
Midterm Exam
Allowable Time: 1^{hr}

Instructor:
Engr. KHALIL AL-ASTAL

Student Name: ____________________ Student No.: ________________

Question 1

The resistance X of an electrical component has a probability density function :

$$f(x) = A(2x+1) \qquad \text{for } 1 \le x \le 2$$

(a) Find the value of A?

(b) Find the cumulative distribution function ?

Question 2

The probability that an electrical component will fail in less than 1000 hours of continuous use is 0.25. Estimate the probability that among 200 such components:

(a) fewer than 45 will fail in less than 1000 hours of continious use .

(b) between than 20 and 100 will fail in less than 1000 hours of continious use.

Question 3

The thicknesses of glass sheets produced by certain process are normally distributed with mean of $\mu = 3$mm and a standard deviation of $\sigma = 0.12$mm

(a) What is the probability that a glass sheet is thinner than 2.3 mm ?

(b) What is the value of c for which there is a 99% probability that a glass sheet has a thickness within the interval [3.00-c, 3.00+c]? 0.99

P(3-c ≤ X ≤ 3+c)

P((3-c-μ)/σ < Z ≤ (3+c-μ)/σ) 0.99

Φ((3+c-μ)/σ) - Φ((3-c-μ)/σ) = 2Φ(k) - 1 = 0.99

Φ(k) - Φ(-k) = 0.99

Φ(k) - [1 - Φ(k

(c) What is the probability that three glass sheet placed one on top of another have a total thickness greater than 9.50mm?

(d) What is the probability that seven glass sheet have an average thickness less than 3.10mm?

Question 4

In a club of six men and six women, in how many ways can a committee of four be selected if :

(a) The committee must consist of two men and two women?

(b) There must be at least one of each sex?

(c) The women must outnumber the men?

Question 5

Three independent events A, B, and C have probabilities $\frac{1}{2}, \frac{2}{3}, \frac{3}{4}$ respectively. Let X be the number of these events that occur, where $(0 \le X \le 3)$.:

(a) P (X = 0)
(b) P (X = 3)
(c) E (X)
(d) Var(X)

Question 6

The grades of 20 students in statistics midterm exam are as follow :

30	21	15	14	10
19	14	22	27	30
20	18	23	15	16
16	15	29	28	13

(a) Calculate the sample mean, trimmed mean.
(b) Calculate the sample standard deviation .
(c) Find the quartiles.
(d) Draw a boxplot of the above data set

n=20